

## **New York State's Point Source Inventory Merging Criteria and Hazardous Air Pollutant Inventories**

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This paper provides a historical account of the development of New York State's point source inventory system which began in 1992. Over the past ten years, the database has evolved from a relatively basic data entry oriented system to a dynamic system which, in addition to calculating point source criteria and hazardous air pollutant emissions inventories, also supports Title V permitting, Title V compliance and operating program fee billing modules. Work continues to make New York's inventory database management system more compatible with the Great Lakes Commission's RAPIDS and EPA's NEI.

The New York State Department of Environmental Conservation's (Department) Division of Air Resources (Division) started planning for the development of a new data system for processing emissions in 1992, with the need to develop point source inventories which included the addition of hazardous air pollutants (HAPs). The Division was in need of a more comprehensive data system for tracking emissions from point sources after having utilized the SIP Air Pollutant Inventory Management System (SAMS) for processing the 1990 point source criteria emissions.

### **Historical Development of Point Source Inventory**

The need to develop an emission statement / inventory program was fueled by the federal Clean Air Act Amendments of 1990 (CAA). This includes the requirements for ozone nonattainment areas under section 182(a)(3)(B), "Emission Statements"; Title V permit fees under section 502(b)(3)(B); and, the assessment of atmospheric deposition to the Great Lakes under section 112(m). The passage of the New York State Clean Air Compliance Act and the resultant revisions to New York State Environmental Conservation Law also required that the actual emissions information gathered under the emission statement program were to be used to calculate Operating Permit Program Fees to support the Department's Title V program.

The Department initially looked internally to its existing fairly comprehensive permit management system (Stationary Source Management System (SMS)) that permitted emission points (each point equaled a stack) and all associated processes with a contaminant specific emissions requirement. The Department also considered the Environmental Protection Agency's (EPA) emission statement guidance document as a starting point in the planning process.

The end result was the Division's development of a new data system called Air Facility System (NY AFS). Sybase was chosen for the data base and Powerbuilder was chosen for the front end application. Initial plans were to develop an emissions database that would gather contaminant specific emissions of all criteria and hazardous air pollutants for all permitted emission points at the process level. To that effect, the Department promulgated a regulation known as Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Subpart 202-2 entitled "Emission Statements" in 1994. This regulation was contested (see *Eastman Kodak Company v. New York State Department of Environmental Conservation*, Index No.7902-94) and as a result, the Department agreed that the emission statement would not require facilities to report emissions in more detail than what was included in its permit. For example, if a source was permitted to emit miscellaneous volatile organic compounds (VOC), it would not have to report its emissions on a contaminant specific basis for each contaminant covered by that miscellaneous VOC limit.

New York State's annual point source inventory program began in 1993 (1992 emissions). Starting in 1994, the Department required the reporting, in accordance with 6 NYCRR 202-2, of certain hazardous air pollutants and nonhazardous air pollutants (criteria pollutants) by Chemical Abstract Number (CAS) code based on permit data. More specifically, any owner or operator of a facility was required to submit an emission statement to the Department for any calendar year in which the facility had the potential to emit any regulated air pollutant at a rate which equaled or exceeded an applicable threshold. In 1994, approximately twelve hundred facilities were required to file emission statements.

In addition to Volatile Organic Compounds, Oxides of Nitrogen, Carbon Monoxide, Sulfur Dioxide, Particulate Matter, and Lead, there are currently about 500 compounds or materials listed by CAS code and are considered HAP's subject to the reporting requirements of Subpart 202-2. There are currently 20 Class I and 33 Class II compounds that are considered stratospheric ozone depleting substances subject to the reporting requirements of Subpart 202-2.

Concurrently, the first phase of NY AFS (the emissions module) was put into production in 1995. Although the database behind it was growing in size and sophistication, the up-front windows were in their infancy stage and supported more data entry than detailed system calculations. This required additional staff effort by the Department's information systems group as well as the consultants that were hired to do the programming of NY AFS.

Furthermore, momentum had gained on the development of yet a new system to support the issuance of Title V permits, compliance, and fee billing and tracking. All of these operations relied heavily on the same capital budget and consultant staff. This, coupled with staff's ability to successfully process 1993, 1994, and 1995 inventories by hand, resulted in reassessment of computer development priorities and changed the focus of the initial project.

In order to accommodate all of these issues, the emission statement program needed to request data in the same format as Title V permits that were to be issued. To do so for the 1995 emission statement would have required detailed changes to the instructions as the statements were generated from the permit data in SMS. SMS also required facilities to aggregate contaminant emissions on an emission point basis, not on an emission unit basis, as emission units had not yet been defined. Furthermore, since the Title V permitting program was to be phased in over a number of years and SMS was to be decommissioned in the Fall of 1996, the generation of emission statements and the collection of emission data for Title V fee bills became very complicated.

In June 1996, with the promulgation 6 NYCRR Part 201, the Title V program and the format permits were to be issued shaped the way we were to gather emissions data. The EPA published White Papers in 1995 to provide permitting flexibility under the Title V program. The provisions of the White Papers and resultant changes to the Title V program changed the Department's emission point/process level permitting system to an emission unit/process level permitting system. While on paper they appear only to be different in name, an emission unit can be a collection of points and processes within a facility with no physical connection between the points and the emissions from a process. As mentioned earlier, under the provisions of the settlement agreement on the Department's emission statement program, the Department cannot ask for more information than is contained in the permit. Some of the ramifications of the changes in the permitting program were the loss of the relationship between process data, including emissions, and stacks; the loss of non-hazardous CAS specific contaminants to volatile organic compound (VOC) (i.e., VOC - NY210-00-0 instead of [n-Butyl Alcohol 000071-36-3 and Naptha 008030-30-6 etc.]), and particulate matter (PM) totals (HAPs still required); and, the ability to relate historical emissions data from points to units. This has had serious impacts on the Department's ability to compare facility emissions and emissions inventories from year to year.

The Division handled the transition from emission points to emission units by initially making every emission point an emission unit. Title V facility permits constructed emission units in a manner consistent with a facilities permit application. When building an emission statement based on a final Title V permit, staff was required to map the newly created unit identification back to the initial process. This is a labor intensive process in which historic SMS data is compared side-by-side with Title V permit data, and the relationship of emission processes to emission points are manually entered into AFS. To date, the Division has converted about seventy five percent of it's emission statements to a Title V unit basis.

Refinement of the NY AFS emissions module continued through the summer of 1999, where it has remained a part of an integrated permitting, compliance, emissions and fee data system. Some of the emission module enhancements included the ability to calculate criteria emissions with the push of a button, utilizing published emissions factors and utilizing a given facility-provided throughput at the

process level. The system module has canned reports, quality assurance and control programs that verify certain aspects of the data as well as built in an error messaging for critical data elements.

Currently, any owner or operator of a facility in New York State that is required to obtain a Title V permit pursuant to 6 NYCRR 201-6 must submit an emission statement to the Department for any calendar year in which the facility is required to have a Title V permit.

If the actual emissions or potential to emit of a facility equals or exceeds the facility reporting threshold for any regulated air pollutant, emissions of all regulated air pollutants emitted must be reported even if the other regulated air pollutants are emitted at a level below their respective thresholds. Regulated air pollutants must be reported as individual chemicals (chemical abstract number) as listed in the facility's certificates to operate issued pursuant to 6 NYCRR Part 201.

Emission statements include facility level information, consisting of (i) verification of full name of facility; (ii) verification of parent company name; (iii) verification of street address (physical location) of the facility; (iv) verification of four digit SIC code(s) for the facility; (v) calendar year reportable emissions; (vi) total facility fuel use and fuel sulfur content and heat value (for combustion installations); and (vii) fugitive emissions.

Emission statements also include emission point level information, consisting of (i) average hours of operation per day (peak ozone and carbon monoxide seasons); (ii) average days of operation per week (peak ozone and carbon monoxide seasons); (iii) weeks of operation per year (seasonal and annual); (iv) hours of operation per year; (v) percentage annual throughput (percentage of annual activity by season) and (vi) verification of latitude and longitude.

Emission statements also include process level information, consisting of (i) maximum heat input (for combustion installations); (ii) quantity of fuels consumed (for combustion installations); (iii) estimated actual annual reportable emissions, for each air regulated air pollutant emitted, (in units of pounds per year); (iv) estimated emissions method; (v) emission factor(s) (if used to determine actual emissions); (vi) primary and secondary control equipment identification code(s); (vii) control efficiencies achieved by the control equipment; (viii) annual process rate; and (ix) peak ozone season daily process rate.

Petroleum, volatile organic liquid, and fuel storage and distribution facilities must provide the following additional information: (i) tank capacity (including maximum and average liquid height, and working volume); and (ii) throughput associated with tanks and loading racks (including turnovers per year).

Emissions estimates shall be based on the owner's or operator's use of the following methods. For each instance, the owner or operator must utilize one of the following emissions estimation methods to represent actual emissions emitted during the calendar year: (1) stack samples or other emission measurements; (2) material balance using knowledge of the process; (3) national emission factors; (4) best engineering judgement (including manufacturers' guarantees); (5) state or local agency emission factors approved by EPA; (6) standard EPA emission factors (SCC emission factor). The Department shall assign the SCC to a particular facility. A source owner may request the Department to change an assigned SCC; (7) other published emission factors; and (8) other estimation method.

### **Current System Limitations / Needed Improvements and Upgrades**

The Division's Stationary Source Planning Section is required to report hazardous air pollutants

as part of its commitment to the Great Lakes Commission Air Toxics Project and EPA's NEI. A limitation of the current AFS system is that stationary source emissions data cannot be directly exported to RAPIDS or the NEI. There are many NEI issues that keep the Department from exporting the data to RAPIDS, and vice-versa. The functionality exists, but a number of programs are required to be run off-line in order to complete a RAPIDS extract. The Department is currently working to achieve an AFS system that will identify the information needed in the format needed to export directly to RAPIDS and NEI without the need for other programs. The Department is also concurrently working on resolving area source inventory issues, as well as emission factor updating issues.

Staff currently extracts all information from AFS and needs to speciate combustion HAP's in RAPIDS. Having a HAP calculator button/window in AFS would allow staff to perform this function in AFS using emission factors. A HAP calculator function would require the calculation of emissions using emission factors in AFS while accounting for and adjusting criteria emissions already populated during our criteria contaminant calculation. For example, mercury is a HAP as well as a particulate. If particulate emissions have already been calculated and the Department finalizes the inventory by calculating mercury emissions, the Department will need to modify particulate emissions to account for the particulate percentage of mercury.

Speciating in AFS would allow for a direct export to the Great Lakes Commission and would harmonize the two data systems (i.e. both AFS and RAPIDS would now contain combustion HAP's.)

The Department also reports HAP's speciated emissions from 20 area source categories, on-road sources and nonroad sources to the GLC. Area source emissions, with the exception of unspciated VOC's, are speciated using various methodologies. Currently, area source emissions inventories are maintained in Microsoft Access format, and can not be imported into RAPIDS. Once area source emissions can be imported into RAPIDS, which is anticipated to be by June 2002, VOC's can be speciated there, resulting in a more detailed area source inventory. On-road mobile and nonroad source inventories can be imported into RAPIDS and speciated.

In conclusion, over the past decade, the Department has been successful in achieving a criteria pollutant and hazardous air pollutant emissions inventory database that satisfies the needs of the Department. However, difficulties remain in the maintenance of the system because AFS, RAPIDS and the NEI are all dynamic. The Department has collected all of the data needed to maintain complete inventories, but continues to strive to achieve a workable connection with external emissions inventory databases.

**Key Words:**

Inventories

New York

HAP's

Point Source

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